THE IMPACT OF ACCOUNTING EARNINGS ON MALAYSIAN STOCK PRICES

SOME EMPIRICAL EVIDENCE

by

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ABSTRAK

Kajian ini menyiasat hubungan di antara magnitud perubahan perolehan luar jangka dan pulangan saham luar biasa, dengan menggunakan data pasaran saham Malaysia.

Penyesuaian Beta dengan model Scholes-Williams tiga tempoh masa "leads / lags" telah diadakan untuk mengurangkan kesan kepincangan (bias) dagangan tipis. Teknik pengumpulan berdasarkan pulangan saham luar biasa telah digunakan untuk menghilangkan komponen sementara (transitori) perolehan akaun dan seterusnya mengubah perhubungan antara magnitud perubahan perolehan luar-jangka dan pulangan saham luar-biasa.

Keputusan keseluruhan menunjukkan korelasi pangkat (rank correlation) positif antara magnitud perubahan perolehan luar-jangka dan pulangan saham luar biasa. Pemencilan komponen tetap perolehan luar biasa memberi keputusan bercampur di mana kekuatan persatuan antara magnitud perubahan perolehan laur jangka dan pulangan saham luar biasa menunjukkan kemajuan bila portfolio dibentuk dengan mengumpul data dari keseluruhan tempoh ujian. Akan tetapi tiada kemajuan yang ketara diperolehi bila portfolio dibentuk berasaskan tahun.

ABSTRACT

This study investigates the association between the magnitude of unexpected earnings changes and the abnormal stock returns, based on empirical evidence from the Malaysian stock market.

Appropriate adjustments to mitigate possible effects of thin trading bias are carried out using Scholes-Williams three period leads / lags model. Grouping technique based on abnormal returns is used to diversify away the transitory component of accounting earnings, thereby altering the relationship between the magnitude of unexpected earnings and abnormal returns.

The overall results show positive rank correlation between the magnitude of unexpected earnings changes and abnormal returns. The isolation of permanent component in earnings changes yields mixed results whereby the strength of association between the magnitude of unexpected earnings changes and abnormal returns improves when portfolios are formed by pooling the data over the whole test window. However no significant improvement on the strength of the association by the isolation of permanent earnings changes is observed when portfolios are formed on yearly basis.

Chapter 1

INTRODUCTION

Considerable empirical research focused on the relation between security returns and unexpected earnings have been developed since the seminal work of Ball and Brown (1968) on the subject. The bulk of the extant empirical literature either focus on whether earnings announcements convey information about future cash flow (termed event studies), or focus on whether the earnings determination process captures in a meaningful and timely fashion the valuation relevant events (termed association studies). The former infers whether the earnings announcement per se causes investor to revise their expectation and hence the securities price over a short period around the earnings announcement. Association studies on the other hand investigate whether accounting earnings measurements are consistent with the underlying events and information set reflected in stock prices. This is normally conducted by regressing returns over relatively long periods on unexpected earnings or other performance measures estimated over a forecast horizon that corresponds roughly with the fiscal period of interest.

Ball and Brown (1968) examined the association between the sign of unexpected earnings changes (earnings forecast errors) and share price changes (abnormal security returns). Their approach has been extended to examine more subtle hypotheses such as : (1) relative association among alternative forecast errors (Clubb (1995), Ali and Zarowin (1992), Easton and Harris (1997)); and (2) marginal effects of multiple signals (Kormendi and Lipe (1987), Easton and Sinclair (1989), Collins and Kothari (1989), Penman (1992), Strong and Walker (1993)). Lev (1989) made a

comprehensive review of empirical researches on earnings for two decades since the pioneering work of Ball and Brown.

There are relatively few earnings research based on the movement of securities prices in the relatively thinly traded Kuala Lumpur Stock Exchange (KLSE). Annuar, Ariff and Shamsher (1992) investigated the KLSE's ability to anticipate the information content of changes in annual earnings and dividends announcements. Most local studies including the one just cited stopped at revealing the evidence on the direction of earnings effect. However, no published study try to provide empirical evidence on the magnitude of accounting-based earnings effect on share prices in Malaysia, as that has been done by Beaver, Clarke and Wright (1979) on the U.S. market and Ariff, Loh and Chew (1997) on the Singapore market.

1.1 The Research Objective

The motive of this study is to extend one aspect of Ball and Brown study by following the procedure of Beaver et al. (1979) and Ariff et al. (1997). In their concluding remarks, Ball and Brown (1968) mentioned :

> ....The relationship between the magnitude (and not merely the sign) of the unexpected income change and the associated stock price adjustment could also be investigated. This would offer a different way of measuring the value of information about income changes, and might, in addition, furnish insight into the statistical nature of the income process, ...

In the spirit of Ball and Brown, the objective of this study is to examine the hypothesis that *a positive ordinal association exists between the magnitude of accounting-based earnings changes (earnings forecast errors) and the stock prices (unsystematic security returns) in Malaysia.*

1.2 Significance of the Study

Followed naturally from the motivation of this study which is methodological, the findings could alter the implications drawn from other security returns studies. To illustrate, studies on the marginal effect of earnings and dividend announced contemporaneously (e.g. Easton and Sinclair (1989)), will find the incremental explanatory power of dividends reduced if magnitude of forecast error were taken into consideration in addition to earnings changes and/or earnings levels. The same can be said of studies that compared the explanatory power between cash flows, funds flows and earnings (e.g. Clubb (1995)). These come logically as (1) earnings, cash flows, fund flows and dividends are correlated, and (2) the magnitude of earnings forecast errors have explanatory power. Apparently if the security returns metric has been conditioned on the magnitude of earnings forecast error, explanatory power of the other contending variables will diminish. In the words of Beaver et al. (1979) :

> ..... the observed explanatory power is a function of how the variables are measured. In particular, throwing away information about one variable leaves open the possibility of permitting other variables to act as instrumental variables reflecting the omitted data.

As this study replicates the methodologies adopted by Ariff et al. (1997) and Beaver et al. (1979), another motive of this study is to gather empirical evidence on whether the capital market of newly-industrialize economy of Malaysia behaves consistently with the Singapore market or with the more developed US market. And, whether the strength of the relation between the magnitude of changes in disclosed earnings and share prices is as pronounced compared with the two.

1.3 Organization of the Report

Chapter 1 set the stage for the subsequent analysis by introducing the preliminaries. Chapter 2 reviews some previous researches that are relevant to the topic. The theoretical framework is formulated in Chapter 3 and the research methodology is designed to test the hypothesis outlined. Chapter 4 presents the findings of the study and the paper ends with some concluding remarks and discussions on the implications and limitations in Chapter 5.

Chapter 2

LITERATURE REVIEW

2.1 Accounting Earnings and Share Prices

The predictive approach to accounting practice calls for the adoption of accounting numbers that have the highest association with market prices. However the theoretical link between accounting information and market reactions is contingent on the theory and evidence of the efficient market model, whereby prices react instantaneously and without bias to new information (accounting information included). Using theory and evidence regarding the efficient market hypothesis, the information content of financial accounting numbers has been studied extensively using research methodologies provided mainly by the capital asset pricing model, portfolio theory, and the market model.

Ball and Brown (1968) is perhaps the first attempt to assess empirically the relative importance of the annual income number. Since then, various studies reported results consistent with the hypothesis that accounting information - especially earnings - conveys information leading to changes in equilibrium prices. Researchers adopting the procedure in Ball and Brown (1968) will find that security prices react in the same direction contemporaneously with the announcement of earnings in semi-strong form efficient markets. Annuar et al. (1992) have reported the same findings in Kuala Lumpur Stock Exchange with evidence that the market anticipates the information content of annual earnings announcement well before the official announcement.

Various studies also concluded a strong indication of significantly positive relationship between unexpected price changes and the strength and magnitude of expected earnings, albeit a weak one as pointed out by Lev (1989).

2.2 Permanent and Transitory Components of Earnings.

Earnings persistence is defined as the extent to which an innovation (unexpectedness) in the earnings series causes investors to revise their expectation about future earnings. It is widely agreed that the intrinsic value of a stock depends on the firm's future earnings prospects. This suggests that changes in a stock's intrinsic value, and hence its price, will correlate with changes in the permanent component of its earnings but not with changes in the transitory component. Kormendi and Lipe (1987) reported a positive association between the estimates of earnings persistence and the security returns. Collins and Kothari (1989) showed that when a measure of persistence was added to the independent variables in their model of risk, returns, growth and interest rate, its coefficient was statistically significant and the R^2 improved. Beaver, Lambert and Morse (1980) used grouping technique based on price changes to diversify away the transitory elements in earnings and permitted an isolation of changes in permanent earnings. The same technique was adopted by Ariff et al. (1997)

2.3 Earnings Changes vs. Earnings Level

Many accounting studies used earnings changes as a proxy for unexpected earnings under the assumption that annual earnings are purely permanent, and the characterization of annual earnings as a random walk. This includes Ball and Brown (1968), Beaver et al. (1979), Beaver et al. (1980), and Ariff et al. (1997), among others. However, Lev (1989) expressed concern about the pervasiveness of low R^2 statistics in returns/earnings association studies, cited the focus on earnings levels as a potential direction for improvement. Easton and Harris (1991) showed that both earnings levels and changes (deflated by beginning-of-period stock price) have explanatory power when they were included simultaneously in a regression of annual returns on earnings. Ali and Zarowin (1992) managed to show that earnings level captures transitory components in earnings which was ignored by earnings changes variable.

2.4 Portfolios vs. Individual Company Analysis

Lev (1989) put forward a number of non-mutually exclusive explanations for the low returns/earnings association in many previous studies : (1) poor specification of the estimating equation, plagued by the existence of residual non-normality, non-linearity and heteroscedasticity; (2) market inefficiency whereby investors systematically err in information interpretation; (3) poor informational properties (quality) of reported earnings because of biases induced by accounting measurement practices or manipulation of the earnings measurement process. Lev went on to cite the focus on

forming portfolios, to test the ability of financial information items for the prediction of abnormal returns, as a potential direction for improvement. In fact Beaver et al. (1979) have adopted this technique to reduce the idiosyncratic errors in individual company observations to obtain improved strength of correlation. The same was adopted later by Ariff et al. (1997).

2.5 Summary

As mentioned in section 1.1, this study seek to extend one aspect of Ball and Brown (1968) research whereby the relationship between the magnitude of unexpected earnings and the associated stock price changes is investigated. Grouping technique based on price changes as proposed by Beaver et al. (1980) will isolate the permanent component in earnings which is emphasized in this study. For the same reason, earnings changes in lieu of earnings level is adopted based on the findings of Ali and Zarowin (1992). Portfolio level analysis in addition to company level analysis is carried out as a potential to improve the efficiency of test as pointed out by Lev (1989).

Chapter 3

THEORETICAL FRAMEWORK AND RESEARCH DESIGN

The discussion on research design will start from the security return metric, taking into consideration the thin market effect of KLSE, and then turn to the earning forecast model. Sources of data and the test procedures will be detailed subsequently.

3.1 Security Return Metric

It has been the common approach in many previous researches, Ball and Brown (1968), Beaver et al. (1979), Ariff and Johnson (1990), Easton and Harris (1991) and Annuar et al. (1992), among others, to represent unsystematic security returns by the residual terms in the single index market model :

$$R_{it} = \alpha_i + \beta_i R_{mt} + \epsilon_{it} \quad (1)$$

where

R_{it} = rate of return for security i in period t.

R_{mt} = rate of return for market portfolio of KLSE in period t

ϵ_{it} = the unsystematic return on security i in period t, attributable to non-market forces

= abnormal return, AR_{it} (by definition)

α_i , β_i = respectively the intercept on slope coefficient specific to security i

By construction, $E(\epsilon_{it}) = 0$ and $cov(R_{mt}, \epsilon_{it}) = 0$

such that

$$\beta_i = \frac{\text{cov}(R_{it}, R_{mt})}{\text{var}(R_{mt})}$$

$$\alpha_i = E(R_{it}) - \beta_i E(R_{mt})$$

In general, R_{mt} and ϵ_{it} will not be independent even though they are uncorrelated. However if R_{it} and R_{mt} are assumed to be bivariate normal, the dependency will be linear :

$$E(R_{it} \mid R_{mt}) = \alpha_i + \beta_i R_{mt} \quad \text{and}$$

$$E(\epsilon_{it} \mid R_{mt}) = 0$$

On the other hand the possibility of cross-sectional correlation among the unsystematic returns of securities has been the subject of concern because the event of interest might not occur independent of other relevant events. The presence of confounding events occurring at the event date could falsely signal an effect that may not be present. This criticism is likely to be less serious in the presence of a large number of observations and observations from different periods (estimates constructed using a moving window of historical data), favourable and unfavourable effects of confounding events should cancelled out. Bernard (1987) concurred that within the event study context, the bias due to cross-correlation approaches zero as diversification of the samples drives the average degree of cross correlation to zero.

Beaver (1981) identified three potential properties which motivate the use of unsystematic returns (ϵ_{it}) rather than returns (R_{it}), and they are : (1) to create a common expected value of security metric exists over time and across firms; (2) ϵ_{it} can have smaller variance than R_{it}; (3) ϵ_{it} can result in smaller correlation among observations than R_{it} would. In short, the use of unsystematic security returns can be

viewed as a means of extracting unwanted variation from R_{it} due to R_{mt}. As this study is to evaluate the earnings report as it relates to the individual firm, its contents and timing should be assessed relative to changes in the rate of return on the security net of market-wide effects. Hence the unsystematic security returns contained in the foregoing equation are adopted as the security return metric in this study.

3.2 Adjustment for Thin Trading

Thinness of trading is relatively more pronounced in developing capital markets such as KLSE. A non-synchronous trading problem is said to exist when market index at time t is based on stocks with closing prices that do not synchronize at t. As a result, the normality assumption of market model is not met. Another concern is the estimation of ϵ_{it}, α_i and β_i of individual stocks will be biased.

Ariff and Johnson (1990) extended the Scholes-Williams, the Dimson and the Fowler-Rorke procedures of adjusting beta for thin trading to three-period lead and lag. Their study on SES market using all three methods yielded encouraging results in minimizing the biasness due to thin trading. Even though the latter two procedures are theoretically more efficient in requiring a multiple regression as against simple regressions for Scholes-Williams, they appear to provide near equivalent results. Based on their findings, the Scholes-Williams procedure is adopted in this study whereby three lead and lag model based on average of all betas becoming asymptotic to unity is used :

$$\beta_i = \frac{{}_3\beta_i^{-1} + {}_3\beta_i^{0} + {}_3\beta_i^{+1}}{1 + 2\,{}_3\rho_1} \qquad (2)$$

where

β_i = the thinness corrected beta of i^{th} stock

${}_3\beta_i^{-1}, {}_3\beta_i^{0}, {}_3\beta_i^{+1}$ = the ordinary least square estimators based on three period returns

${}_3\rho_1$ = the third order serial correlation coefficient between R_{mt} and R_{mt-1}

The resulting measure of beta coefficient (systematic risk) of each security is an unbiased measure compared to the estimate from the simple market model outlined in the previous section.

3.3 Earnings Forecast Model

Large body of literature suggested that earnings changes (or at least their signs) follow a random walk. Ariff et al. (1997), Annuar et al. (1992), Collins and Kothari (1989), Easton and Sinclair (1989) and Ball and Brown (1979) have all adopted this naive model in one way or the other in their studies; and yield comparable results with other more rigorous method such as regression model, submartingale model and IMA(1,1) model. In particular, Finn and Whittered (1982) investigated the relative accuracy of forecasts from submartingale process and martingale process (naive model), and reported that martingale always outperformed the submartingale with drift factors estimated between one to five earnings changes. It was reported that, unexpected earnings that are based on financial analyst earnings forecasts are able to explain

abnormal returns better than other proxies in developed capital markets. Brown et al. (1987) and Fried and Givoly (1982) attribute the security analyst forecast superiority to broadness and timeliness of information used. However, the absence of authoritative and well-followed security analyst forecast in Malaysia, similar to the value-line of U.S., rules out this option. Thus, annual earnings changes are adopted as the appropriate proxy for unexpected earnings (earnings forecast error) in this study :

$$UE_{iT} = E_{i,T} - E_{i,T-1} \quad (3)$$

where

UE_{iT} : unexpected value of earnings variable

$E_{i,T-1}$: actual values of earnings variable in the year T-1,

$E_{i,T}$: actual values of earning variable in the year T.

The forecast error provides a measure of "surprise" in the earnings announcement, but fails to differentiate between stocks for which large forecast errors are routine and those for which they are rare. To account for this and to permit the comparisons of the magnitude of forecast errors across firms over time, the effect of changing variance or hateroscedasticity on the earnings variable is mitigated by transforming the unexpected value of earnings variable adjusted for volatility differences $s(UE_i)$ to obtain a measure of standardized unexpected earnings :

$$SUE_i = \frac{UE_i}{s(UE_i)} \quad (4)$$

This same measure was adopted by Ariff et al. (1997) and Beaver et al. (1979), among others, to aid in obtaining efficient test statistics in the correlation tests that is to be specified in the subsequent section. A large positive value of SUE would indicate that the earnings announcement contained significant "good news" and vice versa.

Different researchers have adopted various definitions of accounting earnings such as EPS, ROA, ROE, among others. Ou and Penman (1989) went a step further to include a vast array of financial statement ratios as accounting indicator of future earnings to improve the explanatory power of earnings variable. As the motivation of this study is to provide an extension of the Ball and Brown study, and at the same time to enable direct comparison with the findings of Ariff et al. (1997) and Beaver et al. (1979), the measure for earning variables similar to theirs using EPS is adopted, where

$$\text{EPS} = \text{earnings per share adjusted for minority ownership}$$

$$= \frac{\text{earnings attributable to shareholders - preferred dividends}}{\text{no. of shares}}$$

3.4 Hypothesis

The purpose of earnings forecast error (unexpected earnings) is to facilitate a specification of the relationship between earnings changes and security price changes. To test the strength of the correlation between the magnitude of standardized

unexpected earnings, SUE_i and the cumulative abnormal returns at the event year, $CAR_i = \Sigma_{t=-11 \text{ to } 0} AR_{it}$; and without the support of normality assumption for the two variables, the null and alternative hypothesis are :

H_O : $\rho_S (CAR_i, SUE_i) = 0$ ·

H_A : $\rho_S (CAR_i, SUE_i) > 0$

where ρ_S is the Spearman rank correlation.

The Spearman rank correlation will be computed in two contexts : (1) individual companies and portfolios formed by sorting unexpected earnings, and (2) portfolios formed by sorting abnormal returns to ascertain the correlation strength superiority of permanent component of accounting earnings.

3.5 Data and Test Procedures

Data for this study is compiled from the KLSE Investors' Digest. The Annual Company Handbook is the source for information on financial results announcement date. The data available for use in this is for the period from mid-1986 to mid-1997. Over the period, stock market of Malaysia has gone through steady growth. The starting year was selected to coincide with the year when value weighted KLSE Composite Index (KLCI) was introduced. KLCI that was launched on 4th April 1986 is to be adopted as the proxy for market portfolio in the security return metric in this study. The ending year exclude the period from the second half of 1997 to 1999 when the Malaysian economy went through a major financial crisis. Within this period, the

market experienced high quantum of capital outflow, and the Malaysian Government has imposed capital control since September 1998 to firmly regulate the market. All these actions may severely affect the serial and cross-sectional independence of security price movements, and if included, will render the significance of test results unreliable.

Sampling of companies for monthly closing prices and annual earnings data will be based on stratified random method to ensure that the selection represents different industries and different earnings announcement date to reduce the possibility of cross-sectional correlation between security returns and the calculated systematic risk term, β_i. The additional criteria used for the selection of data are that the companies should have recorded traded monthly prices at least 90% of the time over the whole sampling period and annual reports containing accounting statements are publicly available. Companies that changed their accounting year-end during the relevant period are also excluded to preserve the validity of the research method adopted as discussed later. There were 431 counters on KLSE main-board in June 1997 as compared to 287 in July 1986. However only 162 companies were listed continuously throughout the whole sampling period, out of which 48 counters are finally selected for this study. The composition of the samples selected proportionally covers the various sectors available based on December 1996 listing.

The use of monthly data in lieu of weekly or daily data is to prevent the problems of non-normal distribution and severe non-trading given the thinness of KLSE. Annuar et al. (1992) reported that the Malaysian market anticipates the information content of annual earnings within one year before the official announcement month (event

month), and no significant abnormal returns can be derived on or after the announcement month. The price effect therefore may be measured over the period of t = -11 to t = 0 (the event month). It is observed that 8% of the sampled companies within the test window announced the financial results by the end of the second month after the respective financial year-end and 72% of them announced the financial results by the end of the third month after the respective financial year-end. Hence the third month after the respective financial year-end is adopted as the event month in this study.

Procedures similar to those used by Beaver et al. (1979) and Ariff et al. (1997) are adopted in this study. The previous researchers used 72-month period data before the test window to compute the risk-adjusted returns. However a shorter period is adopted in this study due to the limited length of data available, whereby monthly share price data (adjusted for stock splits, bonus and right issues) from t = -60 to 0 are used to compute monthly security returns, R_{it}, for t = -59 to 0. Corresponding market returns, R_{mt}, are calculated using the KLCI. Market model parameters, α_i and β_i, are estimated using data from t = -59 to -12 with correction for thin-trading. Data for the twelve months prior to the event month are excluded in the computation of market model parameters to reduce possible bias from disclosure effect. The market model parameters are then used to calculate risk-adjusted abnormal returns, AR_{it}, over each month from t = -11 to 0. This leaves a test window of 60 calendar months from April 1992 to March 1997, as the monthly data over the period from December 1986 to March 1991 prior to the test window are used to measure market model parameters for calculating risk adjusted returns.